National Institute of Environmental Health Sciences

The effect of rainfall on the incidence of cholera in Bangladesh

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Abstract:

BACKGROUND: The incidence of cholera in Bangladesh shows clear seasonality, suggesting that weather factors could play a role in its epidemiology. We estimated the effects of rainfall on the incidence of cholera in Dhaka, Bangladesh. METHODS: We examined time-series patterns of the weekly number of hospital visits due to cholera in relation to weekly rainfall from 1996 to 2002. We used Poisson regression models, adjusted for seasonal variation, between-year variation, public holidays, and temperature. The role of river level on the rainfall-cholera relationship was also examined by incorporating river-level terms into the models. RESULTS: The weekly number of cholera cases increased by 14% (95% confidence interval Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 10.1%-18.9%) for each 10-mm increase above the threshold of 45 mm for the average rainfall, over lags 0 to 8 weeks. Conversely, the number of cholera cases increased by 24% (10.7%-38.6%) for a 10-mm decrease below the same threshold of average rainfall, over lags 0 to 16 weeks. River level partly explained the association between high rainfall and the number of cholera cases. CONCLUSIONS: The number of cholera cases increased with both high and low rainfall in the weeks preceding hospital visits. These results suggest that factors associated with river level are on the causal pathway between high rainfall and incidence of cholera.

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Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Precipitation, Temperature

Extreme Weather Event: Drought, Flooding

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

Urban

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Region

Other Asian Region: Bangladesh

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Cholera

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children, Low Socioeconomic Status

Other Vulnerable Population: Women

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified